Improved health outcomes using insulin pump therapy in people with type 1 diabetes

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Improved Health Outcomes Using Insulin Pump Therapy in People with Type 1 Diabetes

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Introduction

"Every 11mmol/mol reduction in HbA1c delays the onset and slows the progression of micro-vascular complications"
(The Diabetes Control and Complications Trial) [1]

In 2013 we implemented a structural educational pathway for insulin pump initiation in NHS Dumfries and Galloway.

We would like to determine the impact of insulin pump therapy following the insulin pump pathway on **glycaemic control, total daily dose (TDD) of insulin, weight, rate of severe hypoglycaemia and diabetic ketoacidosis (DKA).**

Methods

In 2013 all insulin pump initiations were commenced following the insulin pump pathway. Data collection forms were completed prospectively for each patient at baseline, 6 and 12 months scheduled reviews.

Outcomes included measures of HbA1c, weight, TDD from diasend, and incidences of severe hypoglycaemia and DKA from self reporting and hospital records.

Results

By January 2015 a total of 23 patients on insulin pump therapy completed the insulin pump pathway for 12 months.

Results

Glycaemic Control

- Mean HbA1c reduced from **76.2mmol/mol to 62.1mmol/mol** at 12 months (p<0.005)
- Mean reduction in HbA1c at 12 months was **16.1mmol/mol**
- HbA1c range changed over 12 months:-

>75mmol/mol reduced 48% to 9%

58-75mmol/mol increased 30% to 61%

<58mmol/mol increased 22% to 30%

(See Figure below)

Total Daily Dose of Insulin

- The mean TDD of insulin reduced from **61.8 units/day** to **47.5 units/day**(p=0.021)

Weight

- **No significant weight** change during the 12 months (p=0.400)
- Mean reduction in weight was **3.1kg** at 12 months
- Mean weight gain was **4.0kg** at 12 months

Severe Hypoglycaemia

- No reported severe hypoglycaemia during the 12 month period

Diabetic Ketoacidosis

- No cases of DKA over the 12 months of commencing insulin pump therapy

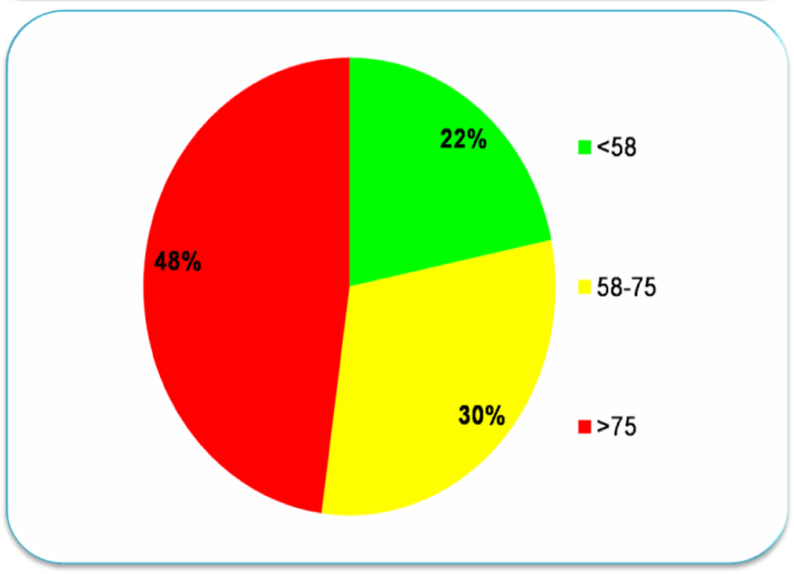
Cost Saving

- Insulin pump and consumables are more expensive at £1091 per year more than MDI[3]
- The Insulin pump offers the opportunity for cost benefits through:-
  reduction in total daily insulin, reduction in hospital admission and outpatient contacts
- **The complications of diabetes increase cost to the NHS five fold** [2]
  Our data would support a reduction in long term complications with improved HbA1c
- Total cost to treat someone with type 1 diabetes in hospital following a severe hypoglycaemic event - **£887**[4]
  Our data showed no evidence of severe hypoglycaemia

Conclusion

- Significant and sustained improvement in glycaemic control
- Long term cost savings as insulin pump therapy can reduce HbA1c significantly hence reduce new and reduce the worsening of the existing micro-vascular conditions
- Reduction in TDD of insulin
- No increase in severe hypoglycaemia or hospitalisation with DKA
- These benefits will allow people to be more productive for longer and reduce sickness absence

16.1mmol/mol reduction in HbA1c over 12 months



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